WHAT IS CLAIMED IS:

1. A computer-assisted method comprising:

accessing stored volumetric (3D) imaging data of a subject;

representing at least a portion of the 3D imaging data on a two dimensional (2D) screen;

receiving user-input specifying a single location on the 2D screen;

computing an initial centerline path of the tubular structure;

obtaining segmented 3D tubular structure data by performing a segmentation that separates the 3D tubular structure data from other data in the 3D imaging data using the single location as an initial seed for performing the segmentation; and

correcting the initial centerline path using the segmented 3D tubular structure data.

2. The method of claim **1**, further comprising incrementally extracting from the 3D imaging data a central axis path of the tubular structure.

3. The method of claim **2**, in which the performing the segmentation further comprises:

initializing a front at an origin that is located along the central axis path;

initializing a propagation speed of evolution of the front to a first value;

propagating the front by iteratively updating the front, the updating including recalculating the propagation speed;

comparing the propagation speed to a predetermined threshold value that is less than the first value;

if the propagation speed falls below the predetermined threshold value, then terminating the propagating of the front; and

classifying all points that the front has reached as pertaining to the tubular structure.

4. The method of claim 1, further comprising:

initializing at least one parameter of a segmentation algorithm;

iteratively performing the segmentation of 3D tubular structure data for separating the 3D tubular structure data from other data in the 3D imaging data, the iteratively performing the segmentation including iterating the segmentation algorithm; and

reinitializing the at least one parameter between iterations of the segmentation algorithm, the reinitializing including adjusting the at least one parameter to accommodate a local variation in data associated with the tubular structure.

5. The method of claim 1, further comprising:

computing a central vessel axis (CVA) of the segmented 3D tubular structure;

representing a 3D image of a region near the segmented 3D tubular on a two dimensional (2D) screen;

displaying on the screen a first lateral view of at least one portion of the segmented 3D tubular structure, the first lateral view obtained by performing curved planar reformation on the CVA of the segmented 3D tubular structure;

displaying on the screen a second lateral view of the at least one portion of the segmented 3D tubular structure, the second lateral view taken perpendicular to the first lateral view;

displaying on the screen cross sections, perpendicular to the CVA; and

wherein the 3D image, the first and second lateral views, and the cross sections are displayed in visual correspondence together on the screen.

6. The method of claim 1, further comprising masking data that is outside of the 3D tubular structure.

7. The method of claim 1, further comprising computing at least one estimated diameter of the segmented 3D tubular structure.

8. The method of claim 7, further comprising flagging at least one location of the segmented 3D tubular structure, the at least one location deemed to exhibit at least one of a stenosis or an aneurysm.

9. The method of claim 7, further comprising displaying the segmented 3D tubular structure using a color-coding to indicate the diameter.

10. The method of claim 1, further comprising displaying the segmented 3D tubular structure in a manner that mimics a conventional angiogram.

11. A computer-readable medium including executable instructions for performing a method, the method comprising:

accessing stored volumetric (3D) imaging data of a subject;

representing at least a portion of the 3D imaging data on a two dimensional (2D) screen;

receiving user-input specifying a single location on the 2D screen;

computing an initial centerline path of the tubular structure;

obtaining segmented 3D tubular structure data by performing a segmentation that separates the 3D tubular structure data from other data in the 3D imaging data using the single location as an initial seed for performing the segmentation; and

correcting the initial centerline path using the segmented 3D tubular structure data.

12. A computer-assisted method comprising:

accessing stored volumetric (3D) imaging data of a subject;

initializing at least one parameter of a volumetric segmentation algorithm;

iteratively performing a segmentation to separate 3D tubular structure data from other data in the 3D imaging data, the iteratively performing the segmentation including iterating the segmentation algorithm; and

reinitializing the at least one parameter between iterations of the segmentation algorithm, the reinitializing including adjusting the at least one parameter if needed to accommodate a local variation in the 3D tubular structure data.

13. The method of claim **12**, further comprising:

receiving user input specifying a single location;

computing a central vessel axis (CVA) path using the single location as an initial seed; and

wherein the iteratively performing the segmentation includes using the CVA path to guide the segmentation.

14. The method of claim **12**, further comprising:

automatically computing a single location to use as an initial seed;

computing a central vessel axis (CVA) path using the automatically computed single location as the initial seed; and

wherein the iteratively performing the segmentation includes using the CVA path to guide the segmentation.

15. The method of claim **14**, in which the automatically computing the single location comprises using a stored atlas of 3D imaging information to obtain the single location.

16. The method of claim **12**, further comprising masking data that is outside of the 3D tubular structure.

17. The method of claim **12**, further comprising computing at least one estimated diameter of the segmented 3D tubular structure.

18. The method of claim **17**, further comprising flagging at least one location of the segmented 3D tubular structure, the at least one location deemed to exhibit at least one of a stenosis or an aneurysm.

19. The method of claim **17**, further comprising displaying the segmented 3D tubular structure using a color-coding to indicate the diameter.

20. The method of claim **12**, further comprising displaying the segmented 3D tubular structure in a manner that mimics a conventional angiogram.

21. A computer readable medium including executable instructions for performing a method, the method comprising:

accessing stored volumetric (3D) imaging data of a subject;

initializing at least one parameter of a volumetric segmentation algorithm;

iteratively performing a segmentation to separate 3D tubular structure data from other data in the 3D imaging data, the iteratively performing the segmentation including iterating the segmentation algorithm; and

reinitializing the at least one parameter between iterations of the segmentation algorithm, the reinitializing including adjusting the at least one parameter if needed to accommodate a local variation in the 3D tubular structure data.

22. A computer-assisted method of performing a segmentation of 3D tubular structure data from other data in 3D imaging data, the method comprising:

initializing a wave-like front at an origin that is located along a path of interest in the 3D imaging data;

initializing a propagation speed of evolution of the front to a first value;

propagating the front by iteratively updating the front, the updating including recalculating the propagation speed;

comparing the propagation speed to a predetermined threshold value that is less than the first value;

if the propagation speed falls below the predetermined threshold value, then terminating the propagating of the front; and

classifying all points that the front has reached as pertaining to the tubular structure.

23. The method of claim **22**, further comprising constraining the front to prevent propagation beyond a predetermined distance from the origin.

24. The method of claim **22**, further comprising receiving user input to specify a single location as the origin.

25. The method of claim **22**, further comprising determining the path of interest using an atlas of stored 3D human body imaging information.

26. The method of claim **22**, further comprising:

initializing at least one parameter associated with the front;

iteratively propagating the front until a termination criterion is met; and

reinitializing the at least one parameter between the iterations, the reinitializing including adjusting the at least one parameter to accommodate a local variation in data associated with the tubular structure.

27. A computer readable medium including executable instructions for performing a method, the method comprising:

initializing a wave-like front at an origin that is located along a path of interest in the 3D imaging data;

initializing a propagation speed of evolution of the front to a first value;

propagating the front by iteratively updating the front, the updating including recalculating the propagation speed;

comparing the propagation speed to a predetermined threshold value that is less than the first value;

if the propagation speed falls below the predetermined threshold value, then terminating the propagating of the front; and

classifying all points that the front has reached as pertaining to the tubular structure.

28. A computer-assisted method comprising:

obtaining volumetric three dimensional (3D) imaging data of a subject;

computing a central vessel axis (CVA) of at least one vessel of interest;

performing a segmentation to separate data associated with the at least one vessel of interest from other data in the 3D imaging data of the subject to obtain segmented data that is associated with a segmented vessel structure;

representing a 3D image of a region of the 3D imaging data on a two dimensional (2D) screen;

displaying on the screen a first lateral view of at least one portion of the at least one vessel of interest;

displaying on the screen a second lateral view of the at least one portion of the at least one vessel of interest, the second lateral view taken perpendicular to the first lateral view; and

displaying on the screen cross sections, perpendicular to the CVA; and

wherein the 3D image, the first and second lateral views, and the cross sections are displayed in visual correspondence together on the screen.

29. The method of claim **28**, further comprising obtaining the first lateral view by performing curved planar reformation on the CVA of the segmented vessel structure.

30. The method of claim **28**, further comprising choosing a direction of the first lateral view to obtain a substantial minimum of curvature of the vessel of interest in an elongated window displaying the first lateral view.

31. The method of claim **30**, in which the choosing the direction includes performing Principal Components Analysis (PCA).

32. The method of claim **28**, further comprising receiving user input specifying a single location as an origin for at least one of the computing the CVA and the performing the segmentation.

33. The method of claim **28**, further comprising specifying the at least one vessel of interest using an atlas of stored 3D human body imaging information.

34. The method of claim **28**, in which the performing the segmentation includes:

initializing at least one parameter of a segmentation algorithm;

iteratively performing the segmentation to separate data associated with a 3D tubular structure from other data in the 3D imaging data, the iteratively performing the segmentation including iterating the segmentation algorithm; and

reinitializing the at least one parameter between iterations of the segmentation algorithm, the reinitializing including adjusting the at least one parameter to accommodate a local variation in data associated with the tubular structure.

35. The method of claim **28**, in which the performing the segmentation comprises:

initializing a wave-like front at an origin that is located along the CVA;

initializing a propagation speed of evolution of the front to a first value;

propagating the front by iteratively updating the front, the updating including recalculating the propagation speed;

comparing the propagation speed to a predetermined threshold value that is less than the first value;

if the propagation speed falls below the predetermined threshold value, then terminating the propagating of the front; and

classifying all points that the front has reached as pertaining to the tubular structure.

36. The method of claim **28**, further comprising masking data that is outside of the vessel of interest.

37. The method of claim **28**, further comprising computing at least one estimated diameter of the segmented vessel of interest.

38. The method of claim **37**, further comprising flagging at least one location of the segmented vessel of interest, the at least one location deemed to exhibit at least one of a stenosis or an aneurysm.

39. The method of claim **37**, further comprising displaying the segmented vessel of interest using a color-coding to indicate the diameter.

40. The method of claim **28**, further comprising displaying the segmented vessel of interest in a manner that mimics a conventional angiogram.

41. The method of claim **28**, in which the displaying on the screen cross sections includes displaying an array of cross-sections that are equally spaced apart on the CVA.

42. The method of claim **41**, further comprising:

displaying a cursor that is manipulable to travel along a view of the vessel of interest; and

in which the array of cross-sections is centered around a location of the cursor.

43. A computer readable medium including executable instructions for performing a method, the method comprising:

obtaining volumetric three dimensional (3D) imaging data of a subject;

computing a central vessel axis (CVA) of at least one vessel of interest;

performing a segmentation to separate data associated with the at least one vessel of interest from other data in the 3D imaging data of the subject to obtain segmented data that is associated with a segmented vessel structure;

representing a 3D image of a region of the 3D imaging data on a two dimensional (2D) screen;

displaying on the screen a first lateral view of at least one portion of the at least one vessel of interest;

displaying on the screen a second lateral view of the at least one portion of the at least one vessel of interest, the second lateral view taken perpendicular to the first lateral view; and

displaying on the screen cross sections, perpendicular to the CVA; and

wherein the 3D image, the first and second lateral views, and the cross sections are displayed in visual correspondence together on the screen.